Guided Assembly: Runtime Studio
Operator Manual v2.0.1.2

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SUPPORT INFORMATION:

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If you are calling after-hours, leave a detailed message and our service department will contact you on the following business day.

If you have a less critical support question, contact us through e-mail:

KolverUSA email - crobertson@blkcorp.com

A response to the question will be sent within 48-hours

SmartMotion by Kolver USA

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Smart Motion - Runtime

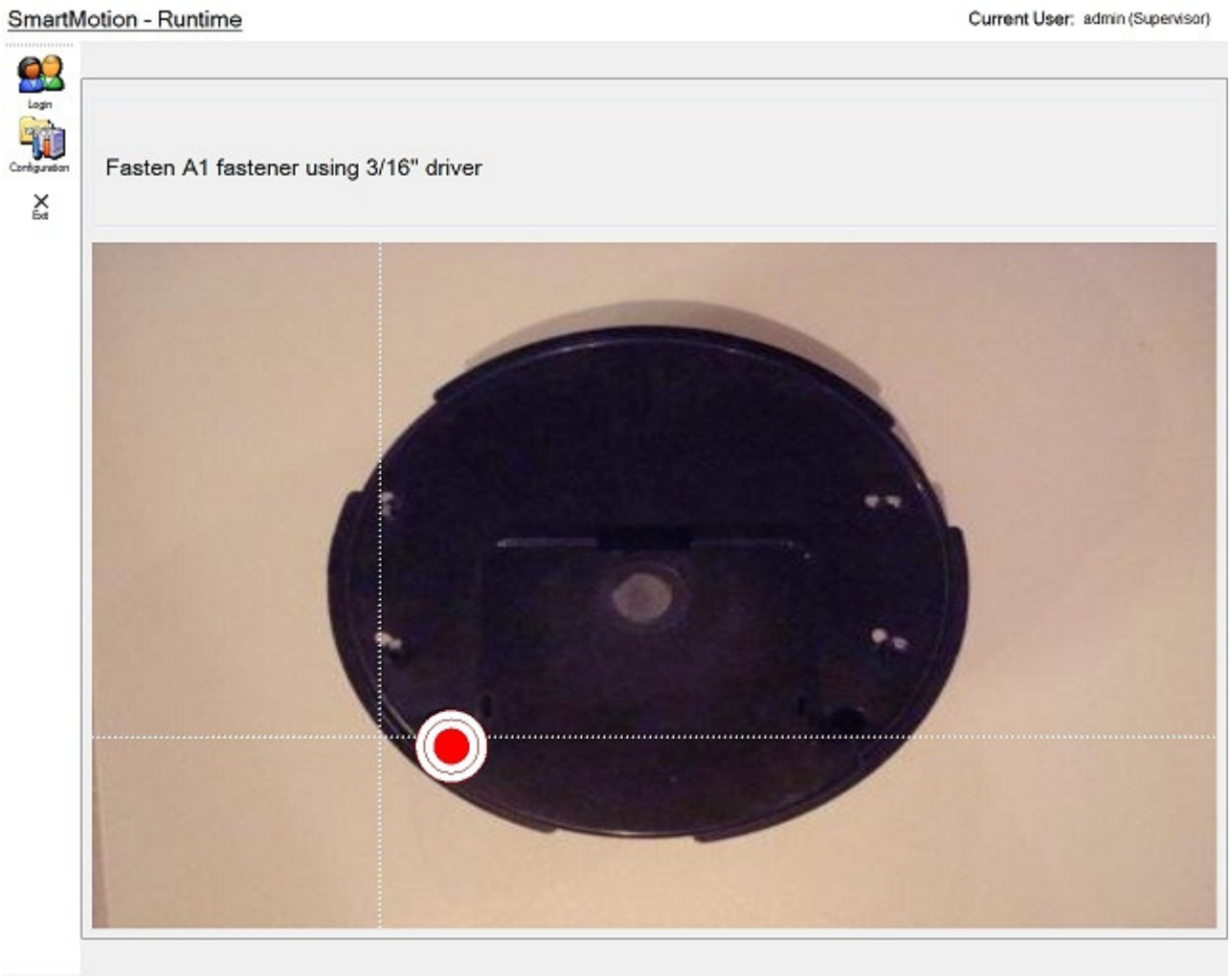
The Smart Motion Runtime application is used to display visual instructions for manual assembly processes. The instruction sets must first be created using the Smart Motion Design Studio. The Smart Motion Runtime interfaces with a Smart-Control Box to display the image and guidance message that corresponds to the current assembly step.

The benefits of the Smart Motion Design Studio and Runtime are:

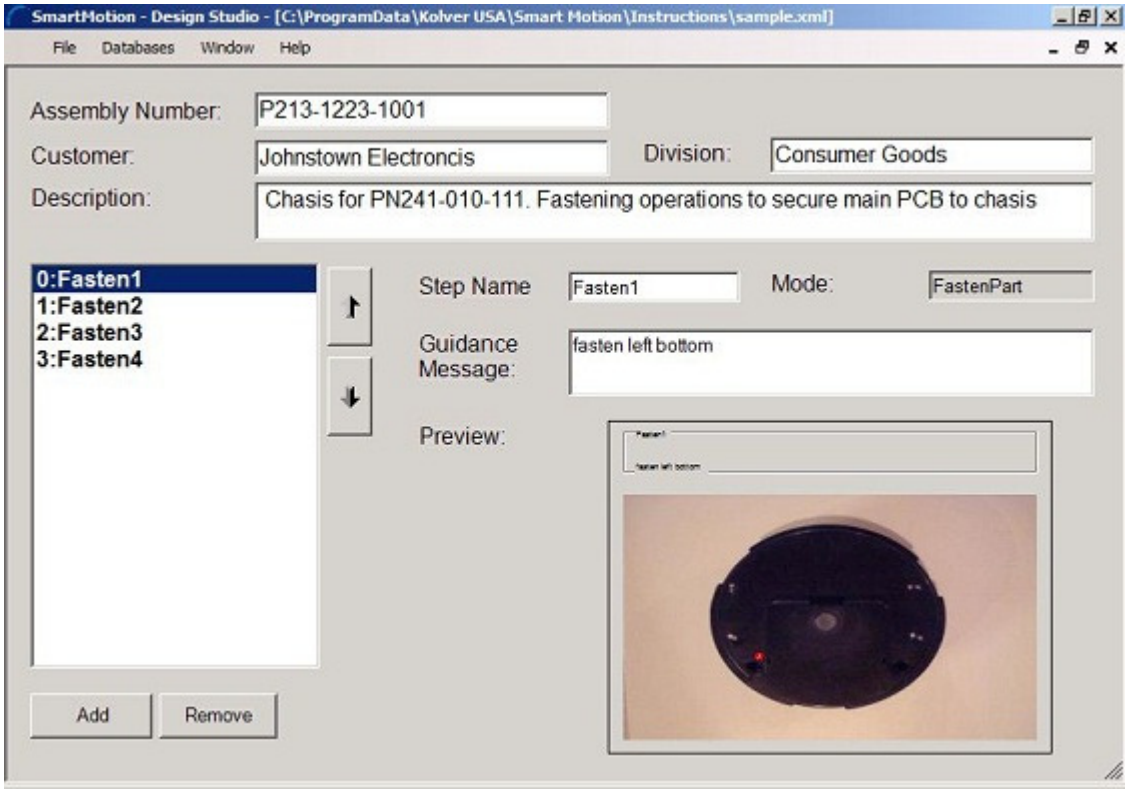
- Reduces ramp up time for new products and operators
- Improves quality by providing additional assembly guidance
- Increases productivity by providing intuitive tool position feedback

Overview

The Smart Motion Runtime application displays a digital image with a crosshair to show the current location and target position for each assembly step as shown below:



The Smart Motion Design Studio allows users to create these instruction sets. The screen shot below shows the editor that is used to create and edit these instruction sets:



Each instruction set is composed of a sequence of instructions that are displayed in the list box on the left side of the screen above.

Getting Started

System Requirements

Processor: 1 GHz

RAM: 512 Mb

Free Disk Space: 2 Gb

Minimum Screen Resolution: 800x600

Operating Systems: Windows XP, Windows Vista, Windows 7

Additional Requirements

The Design Studio applications requires Microsoft .NET 4.0. If not present, the installer will automatically prompt the user to download and install it before continuing

Installation

See Guided Assembly Installation Manual

Uninstalling

To Uninstall Design Studio

1. Click the [Start] button.
2. Select Settings > Control Panel.
3. Double-click Add/Remove Programs.
4. Click Install/Uninstall.
5. Then select Smart Motion Runtime from the list of programs that can be automatically removed.
6. Click the [Remove...] button to uninstall Design Studio.

Starting the program

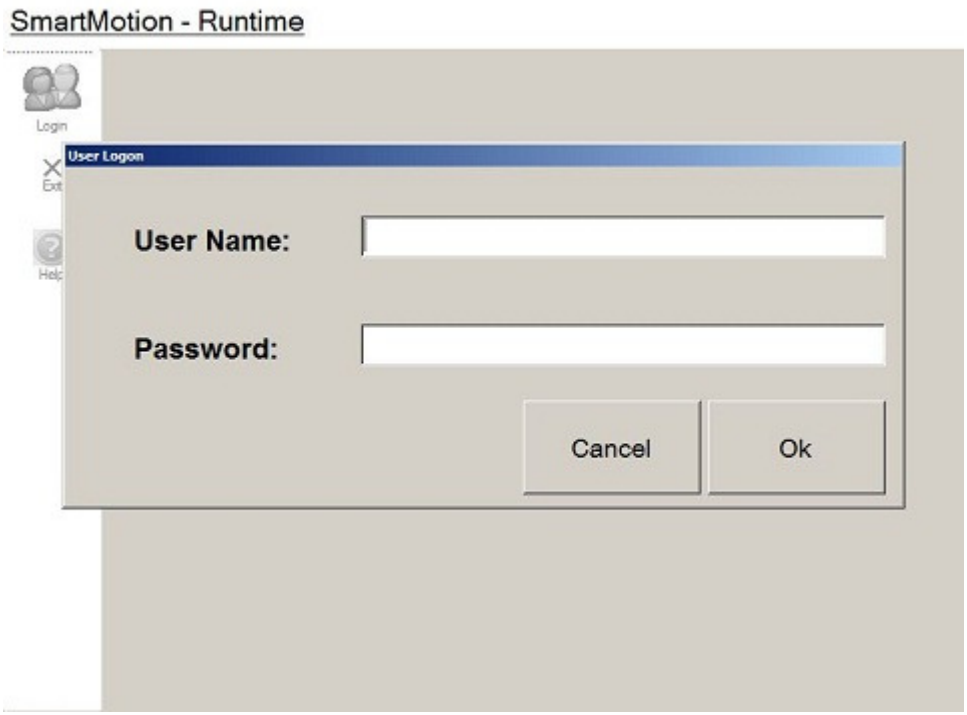
Before launching the Runtime ensure that:

- the Smart Box is connected to the PC
- the Smart Arm has been homed and calibrated
- Sequence assembly mode has been selected

To start Runtime, click the Runtime icon found in the Start menu, in:

Programs > Kolver USA > SmartMotion Runtime

After the application has initialized, the logon screen will be displayed as shown below:

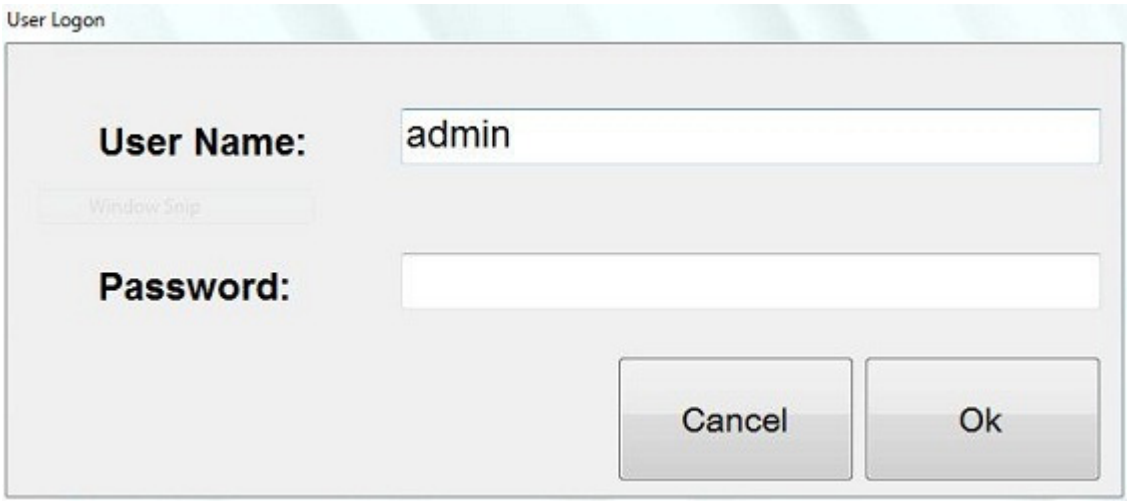


Tutorial

This section contains a series of tutorials designed to help guide you through many different tasks in the application.

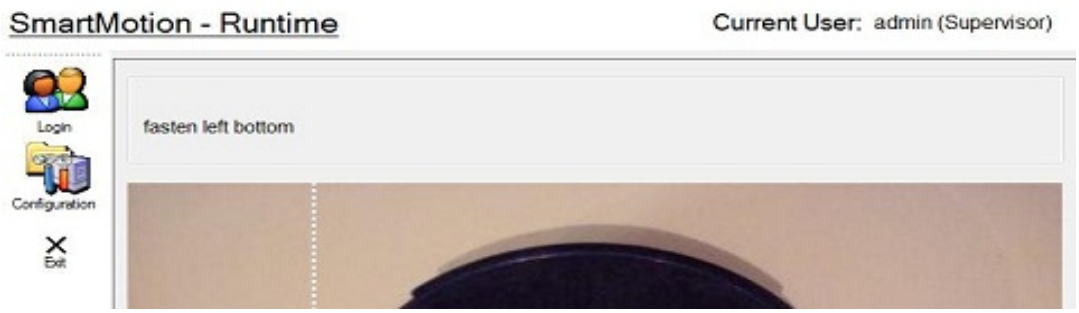
Logging In

To login to the Smart Motion Runtime application, type your user name and password and press the OK button shown below:



To setup user names and passwords, use the Smart Motion Design Studio application. Each user account can be configured as either a supervisor or operator access level. Accounts that are configured as supervisors have the ability to change the active instruction set used by the runtime application.

After successfully logging on to the Runtime application, the main form will be displayed. The user name and access level will be displayed in the top right of the main form as show below:



By default, the Smart Motion product suite comes with the following default user account:

User Name: admin

Password: <none>

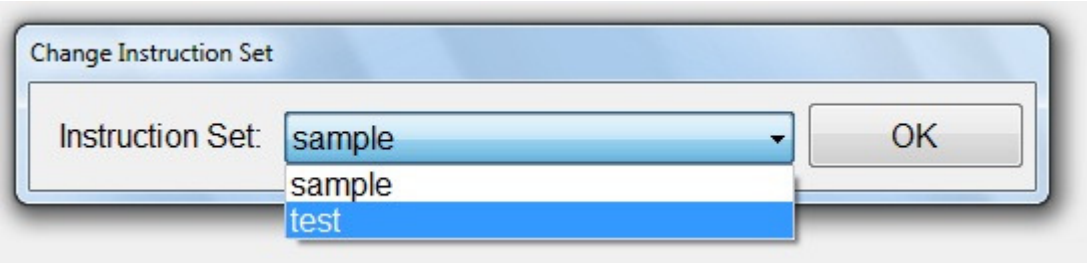
User Level: supervisor

Note: the settings for this default account can be changed by using the Smart Motion Design Studio application.

Selecting an Instruction Set

In order to be able to select or change the active instruction set, the user that is logged onto the Runtime application must be set with the supervisor access level (see Logging on). If there is no instruction set selected or the previously selected instruction set is no longer available, and the logged on user does not have the supervisor access level, an error message will be displayed.

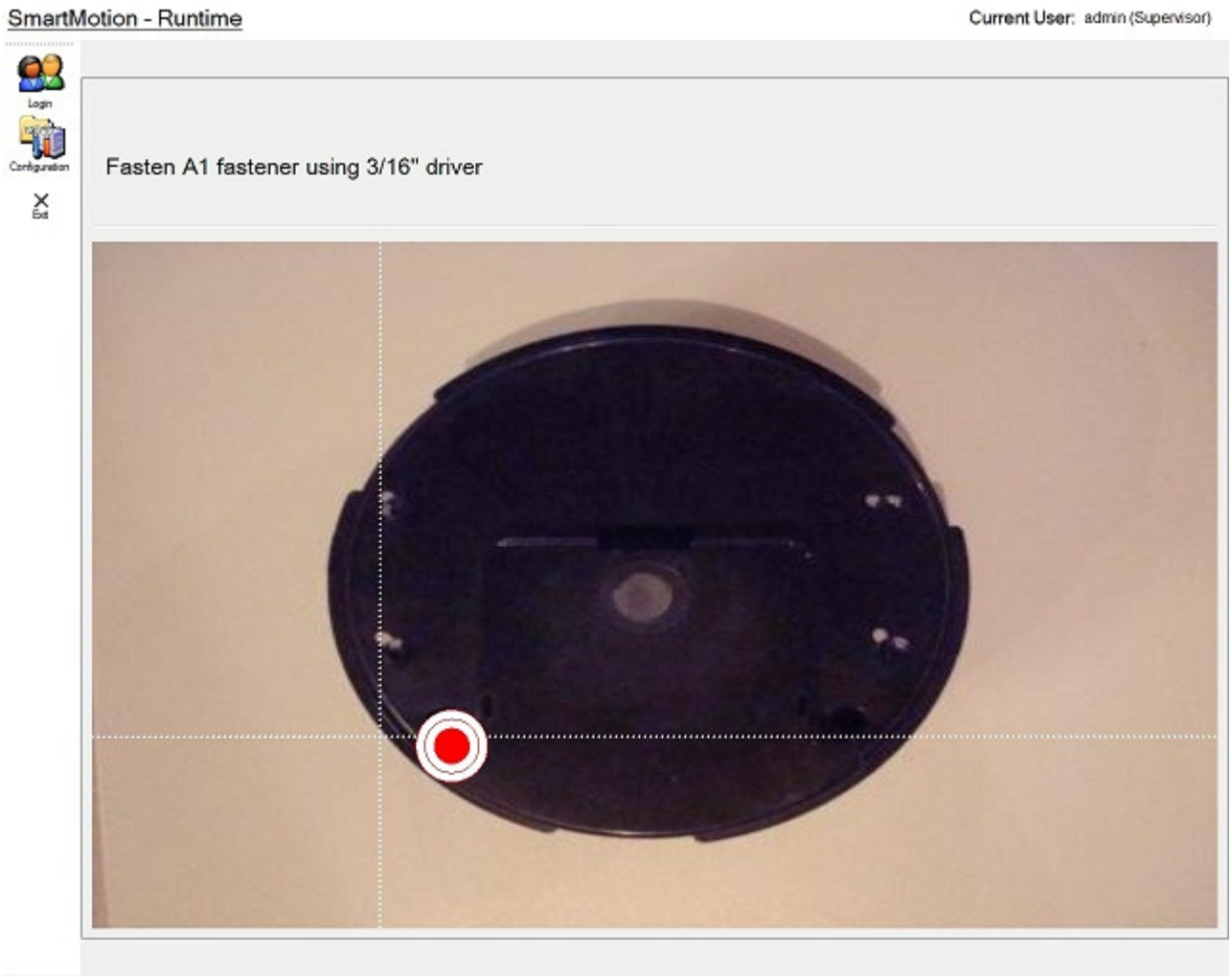
When logged on as a supervisor, you can change the active instruction set by clicking on the configuration button on the toolbar shown on the left side of the main form. The following dialog is then used to select the active instruction set:



Note: the instruction sets must be created and saved in the default location (*<<All User Application Data>>\Kolver USA\Smart Motion\Instructions*) by the Design Studio in order to appear in this drop down list.

Peforming a Fastening Operation

Once you have logged onto the Runtime and an instruction set has been selected, the fastening operation prompt will be displayed as shown below:



Using the crosshair and target shown on the screen, move the Smart Arm to the location indicated and activate the driver. Once the smart box records and successfully fastening operation from the driver, the Runtime application will automatically move to the next step and the target will update to show the location of the next fastening operation.

Troubleshooting

The following error messages can be displayed when using the Runtime application:

Message 1004 : No instruction set selected

In order to select a new instruction set, the currently logged on user must have the supervisor access level (see selecting an instruction set). This error message is displayed when there is no instruction set selected in the Runtime application, and the logged on user does not have the supervisor access level

To resolve this issue:

- Click on the login button and enter a user name and password for a user account that has supervisor access.

Message 1008: Sequence mode not active or missing step

This message indicates that the Runtime is communicating with the Smart Control box, but the smart control box is either not in sequence assembly mode, or the sequence step number from the Smart Control Box does not correspond to any step number form the current assembly step.

To resolve this issue:

- Ensure the Smart Control Box has been properly homed.
- Consult the Smart Control Box user manual to ensure that it is configured for sequence assembly mode
- Check that the assembly step number which should be shown on the display of the Smart Box, corresponds to a step number in the current instruction set

Message 1009: Hardware communication error

This error is shown when the Runtime is unable to communicate with the Smart Control Box.

To resolve this issue:

- Power down the driver connected to the Smart Control Box, and unplug the Smart Control Box from the computer. Reconnect the Smart Control Box to the PC, and turn the driver back on.

Message 1010: Licensing Fault

This error occurs when the Runtime is connected to a Smart Control Box which is is not licensed to work with.

To resolve this issue:

- Contact Kolver USA to ensure that you have the correct license file for your Smart Control Box

Additional Troubleshooting

Issue	Cause
Image flashes on screen then Red X appears	Recipe starting point not at point 00 or Recipe has too many points
Image target location does not match taught	Wrong Runtime Program selected or Incorrect target location taught or # of joints does not match between Runtime program and recipe
Crosshairs disappear for a moment at one location	Normal condition, this is the taught arm origin point 0,0
Gross hairs not present and first target does not change to green	One of the tought locations is actually the origin point of the arm. Teach position off 0,0 point.

Connecting and Communication Recovery

Runtime Studio Connection Sequence

Start Condition:

- Driver Controller Off
- SMB Off
- USB connected between USB and Computer
- Computer Off

Connection Sequence:

1. Power up PC and let boot up complete
2. Power up driver controller which will power up SMB
3. Home Smart Arm
4. Start Runtime Studio Software
5. Login as “admin” and no password
6. Graphic display should show currently loaded Instruction Set

Quick Recovery from communication error

1. Software can stay running on PC
2. Power down driver controller which powers down SMB
3. Wait 5 seconds
4. Power up driver controller which powers up SMB
5. Graphic display should return automatically in a few seconds.
6. May need to home Smart Arm

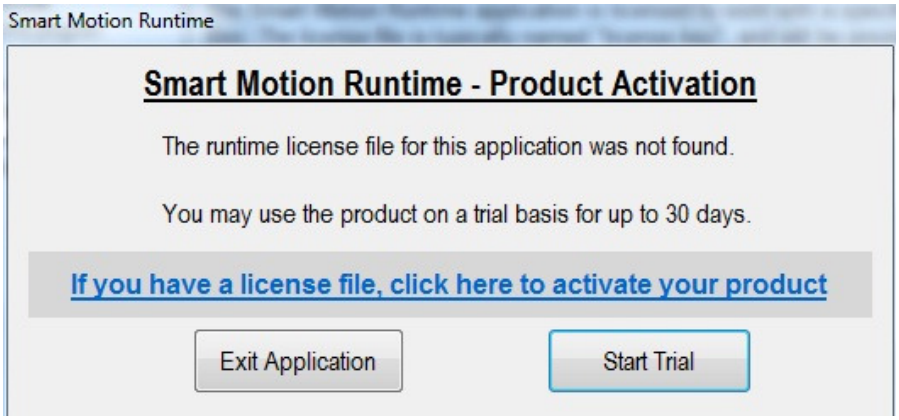
Full recovery If USB gets disconnected and SMB and PC do not reconnect

1. Software can stay running on PC
2. Disconnect USB cable from PC
3. Power down driver controller which powers down SMB
4. Wait 5 seconds
5. Plug in USB to laptop
6. Power up driver controller which powers up SMB
7. Graphic display should return automatically in a few seconds.
8. May need to home Smart Arm

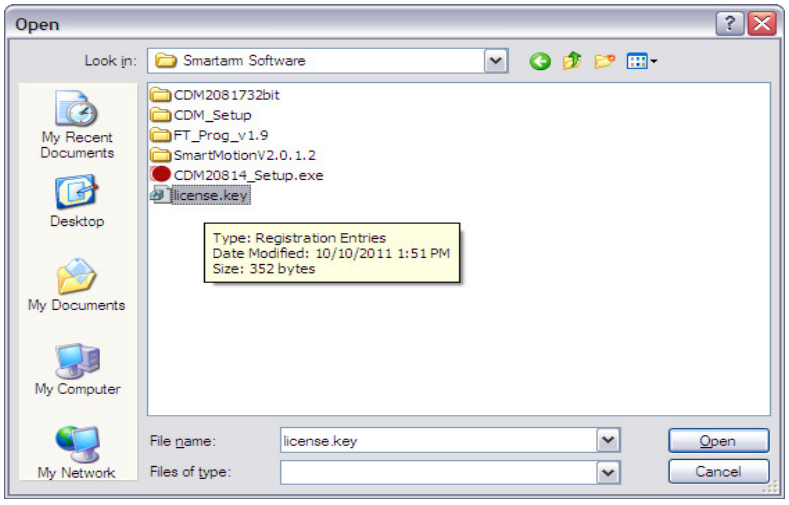
Licensing

The Smart Motion Runtime application is licensed to work with a specific Smart Control Box. The license file is typically named "license.key", and will be provided by Kolver USA when you purchase the product.

You will be prompted to upload the license file when starting the Runtime application:


Smart Motion Runtime
Smart Motion Runtime - Product Activation
The runtime license file for this application was not found.
You may use the product on a trial basis for up to 30 days.
If you have a license file, click here to activate your product
Exit Application
Start Trial

Browser window will pop up for you to locate license key file.



Select the file then click open, restart Runtime Studio and license error should not reappear.

Support

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KolverUSA Service Department: (978) 692-5166

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